AMENDMENTS TO THE CLAIMS

1. (Previously Presented) A method of generating a check matrix for a low-density parity-check code in which at least one of weights of a column and a row is not uniform, the method comprising:

determining a coding rate;

generating a basic matrix that satisfies conditions that weights of rows and columns are constant and number of cycles is equal to or more than six;

determining number of columns and number of rows of the check matrix to be finally obtained;

substituting rows of the basic matrix created, based on a specific relational equation;

searching provisionally an ensemble of row weights and column weights of the low-density parity check code by executing a Gaussian approximation based on a predetermined condition before a row deletion;

deleting rows of the basic matrix after the substituting in order from a bottom by considering the number of rows of the check matrix to be finally obtained;

searching a final ensemble of row weights and column weights of the low-density parity check code by executing the Gaussian approximation based on a predetermined condition after the row deletion; and

dividing at random the row weights and the column weights of the basic matrix after the row deletion based on the final ensemble.

2. (Previously Presented) The method according to claim 1, wherein a basic matrix is generated based on an integer lattice structure that satisfies conditions that the weights of rows and columns are constant and the minimum number of cycles is eight.

3. (Original) The method according to claim 1, wherein the specific relational equation used at the substituting is an equation that can substitute the rows of the basic matrix created such that a weight in a column is placed at a top of the column.

4. (Original) The method according to claim 2, wherein the specific relational equation used at the substituting is an equation that can substitute the rows of the basic matrix created such that a weight in a column is placed at a top of the column.

5. (Original) The method according to claim 1, wherein, in the Gaussian approximation, an ensemble of optimum row weights and optimum column weights is searched at one time based on a linear programming method in a state of a fixed coding rate, and so as to maximize a Gaussian noise distribution.

6. (Original) The method according to claim 2, wherein, in the Gaussian approximation, an ensemble of optimum row weights and optimum column weights is searched at one time based on a linear programming method in a state of a fixed coding rate, and so as to maximize a Gaussian noise distribution.

7. (Previously Presented) The method according to claim 1, wherein, at the dividing, a Latin square of basic random sequence is generated, and a weight of 1 is extracted from each row and each column in the basic matrix after the row deletion, thereby dividing each column and each row at random based on the Latin square.

8. (Previously Presented) The method according to claim 2, wherein, at the dividing, a Latin square of basic random sequence is generated, and a weight of 1 is extracted from each row and each column in the basic matrix after the row deletion, thereby dividing each column and each row at random based on the Latin square.

9. (Previously Presented) The method according to claim 3, wherein, at the dividing, a Latin square of basic random sequence is generated, and a weight of 1 is extracted from each row and each column in the basic matrix after the row deletion, thereby dividing each column and each row at random based on the Latin square.

10. (Previously Presented) The method according to claim 4, wherein, at the dividing, a Latin square of basic random sequence is generated, and a weight of 1 is extracted from each row and each column in the basic matrix after the row deletion, thereby dividing each column and each row at random based on the Latin square.

11. (Previously Presented) The method according to claim 5, wherein, at the dividing, a Latin

square of basic random sequence is generated, and a weight of 1 is extracted from each row and each column in the basic matrix after the row deletion, thereby dividing each column and each row at random based on the Latin square.

12. (Previously Presented) The method according to claim 6, wherein, at the dividing, a Latin square of basic random sequence is generated, and a weight of 1 is extracted from each row and each column in the basic matrix after the row deletion, thereby dividing each column and each row at random based on the Latin square.

13. (Currently Amended) An apparatus for generating a check matrix for a low-density parity-check code in which at least one of weights of a column and a row is not uniform, the ~~method~~ apparatus comprising:

a coding-rate determining unit that determines a coding rate;

a basic-matrix generating unit that generates a basic matrix that satisfies conditions that weights of rows and columns are constant and number of cycles is equal to or more than six;

a substituting unit that substitutes rows of the basic matrix created, based on a specific relational equation;

a first weight searching unit that searches provisionally an ensemble of row weights and column weights of the low-density parity check code by executing a Gaussian approximation based on a predetermined condition before a row deletion;

a row deleting unit that deletes rows of the basic matrix after the substituting in order

from a bottom by considering the number of rows of the check matrix to be finally obtained;

a second searching unit that searches an final ensemble of row weights and column weights of the low-density parity check code by executing the Gaussian approximation based on a predetermined condition after the row deletion; and

a dividing unit that divides at random the row weights and the column weights of the basic matrix after the row deletion based on the final ensemble.